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SUMMARY

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TIMBER-SEASONING PRACTICES UNDER CONDITIONS OF HIGH HUMIDITY IN TROPICAL AREAS

By G.W. WRIGHT,
Division of Forest Products,
Commonwealth Scientific
and Industrial Research Organization,
Melbourne, Australia

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TIMBER-SEASONING PRACTICES UNDER CONDITIONS OF HIGH HUMIDITY IN TROPICAL AREAS.

by G.W. Wright, Division of Forest Products, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

Most problems of timber seasoning in humid tropical climates arise from the inherent high humidity itself, lack of protection from frequent heavy rains and the damp conditions engendered by them, insufficient air movement through drying stacks, and an accentuated fungal and insect attack encouraged by these conditions.

Unsatisfactory log harvesting and storage methods can initiate down-grading, particularly from sapstain and borer damage, from decay (a longer term problem), and in some circumstances from log splitting during seasonal dry periods.

The most effective solution is the rapid extraction and conversion of logs, if possible within 24 hours, followed by immediate seasoning.

Where this is impracticable, prophylactic measures are necessary. These are provided by a dip or spray using a fungicide to control stain, e.g. a chlorinated phenol, and an insecticide to control insect attack, e.g. dieldrin or benzene hexachloride. For end protection against splitting, a heavy coating of a petroleum grease, preferably containing a fungicide, is effective.

Seasoning in humid tropical areas can be by air drying, pre-drying or kiln drying, or a combination of these.

Air drying, although slow, has the widest application because of its simplicity and economy. Its main disadvantages are the comparatively high capital investment in stock and yard facilities, the time required, and its inability to provide low moisture contents when the prevailing equilibrium moisture content is high.

The efficiency of air seasoning depends on the effectiveness of pre-seasoning prophylactic measures, and on stacking practice and yard layout which must aim at maximum air movement to prevent the development of zones of highly humidified air in or around stacks. For stack covering a number of small sheds is often preferable to a large shed in which air movement may be inhibited.

Pre-driers are used mostly for preliminary partial drying mainly in tropical regions subject to heavy seasonal rains, high humidities and little wind, particularly where repeated re-wetting would interfere with the operation of dependent processes, e.g. pressure preservation treatments

Other advantages of pre-drying are: a reduction to about 10 or 20%

of the time required for air drying; considerable reduction in stock holding and land space; continuity of output irrespective of weather; flexibility for rapid changes in production schedule; and avoidance of sapstain, insect attack and weather damage.

There is a trend towards kiln drying in many humid tropical areas because it provides a continuity of well seasoned stock, a means of quality control for export or manufacturing purposes, and a minimum of stock holding. However, in these areas special kiln-drying problems can develop due to the large volume of sapwood in trees of some species, and the mixed-species nature of some forests. Then questions of segregation and aggregation for seasoning arise.

The small compartment kiln often has advantages over the large compartment or progressive types because of its value where stock has to be segregated into small parcels to suit differences in drying behaviour.

No radical changes are generally necessary in the design of kilns suitable for other areas. However, economies in building construction may be made because heat insulation is not so critical. Some redesign of venting may be necessary.

Air drying of hardwoods to moisture contents approximating 20 to 25% though cheap in terms of capital investment and drying cost can be dearer in capital expenditure on plant and stock than pre-drying. The costs of pre-drying are in overhead charges on installation cost, and in heating. However, for drying from the green condition to about fibre saturation point, pre-drying plant and drying costs are usually only about one-quarter to one-third of those for kilns. Kiln drying is the most costly of all three methods for drying hardwoods from the green condition, but is generally economical for timbers up to 2 in thick at moisture contents below 25% after partial air-drying or pre-drying.

Pre-seasoning to 30% moisture content is usually necessary for satisfactory pressure preservation treatments of sapwood, or of timbers of non-durable species.

Air seasoning is generally satisfactory for small yards where air-drying conditions are favourable, but for larger operations where there is need for rapid drying, or continuity in production under poor weather conditions, accelerated methods are better. Of these, pre-drying is probably the most flexible, but where maximum drying rates and rapid plant throughput are necessary, specialized methods such as boultonizing, vapour drying, and steam-and-vacuum drying have advantages.

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